



**UNITED STATES DEPARTMENT OF COMMERCE**  
**Patent and Trademark Office**

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Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/136,792	11/20/98	NAKATANI	S 35097.20205.

BARRY E. BRETSCHNEIDER  
MORRISON & FOERSTER  
2000 PENNSYLVANIA AVENUE NW  
WASHINGTON DC 20036-1888

MX71/0927

EXAMINER

FOSTER, D

ART UNIT

PAPER NUMBER

2835

DATE MAILED:

09/27/99

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Notice of Allowability

Application No.  
09/196,792

Applicant(s)  
Nakatani et al.

Examiner  
David Foster

Group Art Unit  
2835



All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course.

☒ This communication is responsive to amendment 9/10/99

☒ The allowed claim(s) is/are 1-14

☒ The drawings filed on Nov 20, 1998 are acceptable.

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE **THREE MONTHS** FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

☐ Applicant MUST submit NEW FORMAL DRAWINGS

☐ because the originally filed drawings were declared by applicant to be informal.

☐ including changes required by the Notice of Draftsperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. \_\_\_\_\_

☐ including changes required by the proposed drawing correction filed on \_\_\_\_\_, which has been approved by the examiner.

☐ including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any response to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

☐ Interview Summary, PTO-413

☐ Examiner's Amendment/Comment

☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

☒ Examiner's Statement of Reasons for Allowance

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# 7/A  
9-27-99  
Roberts

**DETAILED ACTION**

**CIRCUIT COMPONENT BUILT-IN MODULE**

**Nakatani et al.**

***Election/Restriction***

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
  - I. Claims 1-14 are drawn to apparatus, classified in class 361, subclass 760.
  - II. Claims 15-36 are drawn to method, classified in class 29, subclass .
2. The inventions are distinct, each from the other because of the following reasons:

Inventions II and I are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make other and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case pick and place or manual processing.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

A telephone call was made to Barry E. Bretschneider on August 9, 1999, to request an oral election to the above restriction requirement, but did not result in an election being made. An

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**amendment dated September 9, 1999, made an election without traverse of Group I, Claims 1-14. Claims 15-36 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.**

Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a petition under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(I).

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*Examiner's Amendment*

5. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Barry E. Bretschneider on September 20, 1999.

**The application has been amended as follows: Cancel Claims 15-36 which are directed to a non-elected invention.**

*Allowable Subject Matter*

6. Claims 1-14 are allowed.

The following is an examiner's statement of reasons for allowance: The allowability at least in part resides in the overall structural and electrical combination and configurations of an insulating substrate with the special thermal consideration for the construction of the substrate, a plurality of wiring patterns, active circuit component (semiconductor flip-chip) in an internal portion of the substrate, inner via and thermosetting resin to form a circuit component built-in module, the insulating substrate formed of a mixture of inorganic filler and thermosetting resin for better heat release and therefore improved reliability of components arranged internal to the insulating substrate.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

### *Conclusion*

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The best art to consider with this application can be found in Takagi et al. (4,800,459), Oyama et al. (4,417,297), Malladi (5,939,782), Gerber et al. (5,401,913), Nakatani et al. (5,484,647), Kikinis et al. (5,412,538), Takahashi et al. (5,153,987), Nakatani (5,888,627) and Hosomi et al. (5,806,177), Bessho et al. (5,651,179), Nagai et al. (5,677,045), Suzuki et al. (5,045,381) and Ogihara et al. (4,299,873). Takagi et al. disclose a circuit substrate with chip-like electronic components in cavities, through holes and a circuit pattern, Oyama et al. disclose a printed circuit board wherein chip components are mounted in aligned holes, Malladi discloses an IC assembly which includes an IC die, substrate, a plurality of layers, a plurality of electrically conductive vias extend through a plurality of layer and at least two non-intersecting vias extending from the first surface and coupled to electrical contacts of the substrate, Gerber et al. disclose a multilayer board, interconnections between adjacent circuit boards layers and vias where the via hole is filled with a via metal, Nakatani et al. disclose a substrate having through-holes which are filled with conductive resin, Kikinis et al. disclose a low-profile printed circuit

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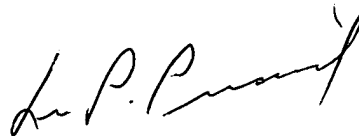
board having components mounted within the board, via holes and semiconductor devices, Takahashi et al. disclose a process for producing printed wiring boards having an insulating layer containing an epoxy resin and synthetic rubber, Nakatani discloses a double-sided PCB having an insulating resin layer containing an inorganic filler, through holes with electroconductive resin paste filled into the through holes, Hosomi et al. disclose a process for producing multilayer PCBs, Bessho et al. disclose a method for mounting a device on a circuit board by means of a thermoplastic conductive adhesive and allowing a thermosetting resin to fill a gap between the board and the device, Nagai et al. disclose a laminate and multilayer printed circuit board comprising an insulating layer constituted by a resin portion for coefficient of thermal expansion considerations, Suzuki et al. disclose a thermosetting resin composition printed circuit board using the resin composition and process for producing printed circuit board and Ogihara et al. disclose a multilayer circuit board having bonding layers containing an organic or inorganic adhesive and an inorganic filler. Though each of the above cited prior art discloses some element of the applicant's invention none have the overall structural and electrical combination and configurations of an insulating substrate with the special thermal consideration for the construction of the substrate, a plurality of wiring patterns, active circuit component (semiconductor flip-chip) in an internal portion of the substrate, inner via and thermosetting resin to form a circuit component built-in module, the insulating substrate formed of a mixture of inorganic filler and thermosetting resin for better heat release and therefore improved reliability of components arranged internal to the insulating substrate as does applicant.

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8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Foster whose telephone number is (703) 308-1763.

DAF

September 27, 1999

A handwritten signature in cursive script, appearing to read "Leo P. Picard".

Leo P. Picard  
Supervisory Patent Examiner  
Technology Center 2800





UNITED STATES DEPARTMENT OF COMMERCE  
Patent and Trademark Office

**NOTICE OF ALLOWANCE AND ISSUE FEE DUE**

MM71/0927

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APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/196,792	11/20/98	014	FOSTER, D	2835 09/27/99
First Named Applicant	NAKATANI, 35 USC 154(b) term ext. = 0 Days.			

TITLE OF INVENTION **CIRCUIT COMPONENT BUILT-IN MODULE AND METHOD FOR PRODUCING THE SAME**

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2 35697.20205.	361-760.000	C11	UTILITY	NO	\$1210.00	12/27/99

**THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED.**

**THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.**

**HOW TO RESPOND TO THIS NOTICE:**

**I. Review the SMALL ENTITY status shown above.**

If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

- A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or
- B. If the status is the same, pay the FEE DUE shown above.

If the SMALL ENTITY is shown as NO:

- A. Pay FEE DUE shown above, or
- B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.

**II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.**

**III. All communications regarding this application must give application number and batch number.**

Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

**IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.**

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